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Suicide and Suicide Prevention in Developing Countries

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SUICIDE AND SUICIDE PREVENTION IN DEVELOPING COUNTRIES

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Section-1
Introduction

According to the World Health Organization, suicide is the world's 13th leading cause of death (1).In persons between the ages of 15 to 34 yrs it is the third leading cause of death (13).

Though suicide is a deeply personal and individual act, suicidal behaviour is determined by a number of factors. These can be classified under the terms of predisposing factors and precipitating factors. Predisposing factors are internal determinants operating at the level of the individual. These include such dynamics as personality traits, bonds with family and society, biological and genetic factors etc.

Precipitating factors deal with external or environmental influences upon the individual. These include events such as loss of a job or a loved one, easy access to means to commit suicide, social humiliation etc.

Suicide rates have increased in many developing countries. But the reported rates are misleading because, population counts are unreliable, inefficient civil registration system, non-reporting of death, and suicide's legal and social consequences. Hence, the available suicide figures are gross underestimates. A recent population based study in India found that with more accurate data collection, the suicide rate in a defined geographical area was nine times the official reported rate. 115

In the West the focus has been on individual psychological factors. In contrast, cultures in the East and also in most developing nations, tend to view suicide as a social problem and the emphasis of their research has always been more on various social stressors than on the identification of mental illness. Mental illness is therefore seen as one of the less common causes of suicide and given equal conceptual status with love affairs, family conflict and social maladjustment. (2) There are marked differences in suicidal behaviour between developed and developing countries. In developed countries suicide rate is high in the age group of 15 to 24 years and highest in the elderly (above 60 years). These are the two peaks. The male female ratio is wider at 3:1 and the divorced / widowed / separated have a higher risk of suicide. In developing countries the highest rate (Single peak) is found in the young (below 30 years), the male female ratio is smaller 2:1 (India 1.4:1, China 1:1.3) and the married women are at a higher risk. The methods used in developed countries are firearms, car exhaust and poisoning whereas in developing countries, it is pesticide poisoning, hanging, and self-immolation. Research in developed countries reveal that above 90% of people who commit suicide have mental disorders, while it is only 60 – 90% in developing countries. Depression is the commonest diagnosis but in developing countries alcoholism and other disorders are also significant. The social stressors associated with suicide are loneliness, rejection, and marital conflicts in developed countries whereas inter generational conflicts, love failure, and exam failure are found in developing countries.

Demography of suicide

Suicidal behaviour has two dimensions. The first dimension is the degree of medical lethality or damage resulting from the suicide attempt. The second dimension relates to suicidal intent and measures the degree of preparation, the desire to die versus the desire to live, and the

chances of discovery (13). The clinical profiles of suicide attempters and completers overlap. Suicide "attempters" who survive very lethal attempts, which are known as failed suicides, have the same clinical and psychosocial profile as suicide "completers"(13).

Sex

In most countries (except mainland China), men have a higher reported rate of completed suicide, whereas women have a higher rate of attempted suicide. Men tend to use means that are more lethal, plan the suicide attempt more carefully, and avoid detection. In contrast, women tend to use less lethal means of suicide, which carry a higher chance of survival, and they more commonly express an appeal for help by conducting the attempt in a manner that favors discovery and rescue.(81,82)

Studies conducted in the developing countries of the African continent shows that the trend of more attempted suicides by women was maintained. But the rates for completed suicide for men were higher. In South Africa for instance 76.8% of all suicide attempts were made by women (15). In Nigeria the ratio for completed suicide for men to women was 3.6 to 1,while a study in Cairo, Egypt conducted in 1975 reported that there was no major difference between the two sexes when it came to suicide attempts (17, 36).

In studies conducted in the Asian countries, the following were the findings regarding the rates of suicidal behaviour in men and women; in China (1995) women committed suicide at the rate of 17.9 per 100,000 population compared to the male rate of 14.3 per 100,000. (48). The male to female suicide ratio in Sri Lanka is 2:1 and has not changed over time. The female suicide rate was 16.8 per 100,000 in 1991 and was second only to China (49). In Pakistan there is a paucity of information on suicide, but a two year analysis of all major news papers showed that men outnumbered women by a ratio of 2:1 when it came to completed suicides (24). Many studies in India have also shown that men have higher rates for completed suicide than women while more women attempt suicide than men (28). But a study conducted in India during the period 1991-97 showed that suicide rates were nearly equal for young women and men, with men having a slightly higher rate 1.3:1,(31)a contrast with the pattern of suicide sex ratios in developed countries.(31) In Korea for the period 1991 to 2000 the suicide rates for men were two to three times higher than that of women(53). In a thirteen year study (1985 to 1997) in Israel, suicide rates in men were three times higher than those in women (37). While a study in Chile on teenagers found that twenty three percent of men and 35% of women had considered committing suicide.(97)

Urban Vs Rural

The world over, suicide rate is reported to be higher in urban centers than in rural areas due to crowding and social isolation. But it has been seen that this can vary with the age and sex of the individuals across countries. Few developing countries report urban and rural rates separately but regional studies from India, China, Sri Lanka and Taiwan indicate that in these countries the rates of suicide in rural areas are higher than in urban cities.(2) Research has shown that in China the rates of suicide in rural areas are three-fold that of urban areas (2,95). In Sri Lanka the suicide rates in the district of Colombo, the commercial capital was 26.3 per 100,000 compared to incidence rates of 69.3 and 60.7 per 100,000 in two predominately agricultural districts.(49) In India also, though the suicide rate for the country was 10.8, the rate in urban area was slightly lower at 9.94 (58)

Marital status

Also in contradiction to West where divorced, separated, widowed and single people are more likely to commit suicide than married people it has been seen that in developing nations individuals who commit suicide are often married and are living ‘in the families’. Rather than marital status *per se* it has been perceived that ‘family and social integration’ are the real determinants, especially in the aged when they suffer from physical illness and poverty.(9)

In a study conducted in a general hospital unit in India it was seen that none of the persons who attempted suicide were living alone, separated or deserted by their partner. Those who were not married were living with their extended family (28). This is consistent with the findings of other studies on marital and family status and suicidal attempters in the Indian population (3,14). A national case-control psychological-autopsy study in China reported that as much as 67% of the persons who committed suicide were married (5). In Pakistan while there were more single men than married men who committed suicide, the trend was reversed in women (24). A study done in Cairo noted that 53% of the subjects were single with 40% being students (36).

Age

The rates of suicide in the aged, especially men, has been steadily rising in most developing countries as in India with depression and chronic physical illness being the main contributing factors (9). But the most vulnerable group are the young adults which has seen a peak in the recent years with the rates rising for both males and females other than in mainland China where the spurt has been restricted to rural females. A study in India concerning the pattern of suicide between 1991-1997 showed that suicide rates rose over this period despite a small decline in the Indian suicide rate in 1995 and 1996. It was found that between 1995 and1997 there was a modest fall in the suicide rates among under 29-year-olds of both sexes, and an increase among those 30 years and older. The incidence of suicides was highest for those in the 30 to 44 year-old category of both sexes and tends to decline in higher age categories (31). Other studies in India also indicate that it is young adults that are at risk, with the age groups between 18 to 29 years (14) in one study and 15 to 39 (3) in a different study being identified as the most vulnerable. In a study done in Pakistan the majority of subjects were found to be less than 30 years of age (24). Another study conducted in Faizlabad, Pakistan from 1998 to 2001 revealed that suicide rate was 1.12 per 100,000, with male preponderance. The peak incidence was in 20-29 years in males and 10-19 years in females (30). In Malaysia the majority who completed suicide were in the age group 20-40 yrs.(45). Researchers in Sri Lanka reported two peak ages for men, the first between 23 to 44yrs and the second after 65yrs. In women the highest vulnerability was between the ages of 15 to 24yrs and there after steadily declined, as the women got older (49). Data from China indicates that 15-34 year olds are the most at risk of committing suicide (50). While a study in Iran for the period 1997 to 1999 on people who committed self-immolation reported that the median age was 25.(67) Another study conducted during a 13-year period (1973-1985) in Jordan on people who had committed suicide with pesticides, 60.7% of the suicides were in the age group of 15-24 years.(94)

A five-year (1996 - 2000) retrospective study in South Africa found that the average age of the suicide attempters was 31.2 years (15). Research findings from Nigeria indicate that most victims were in the third decade of their life (17). This was also confirmed by a 6-month prospective study done in the three main general hospitals in Ibadan, Nigeria. 39 cases of deliberate self-harm were reported out of a total 23,859 subjects attending the sections of hospital studied. Thirty (76.9%) were under 30 years of age and 36 (86.3%) were less than 34 years of age with more than half of the population (51.3%) being students (32). In Ethiopia 66% of the suicide attempters were between the ages of 15-24yrs (18). In Brazil suicide was identified as the sixth leading cause for death among the 15-24 year olds in a nine city survey for the period 1979-98 (16).

Risk and Protective factors

Epidemiologists study large numbers of people who commit suicide to discover common risk factors that are statistically associated with a higher than average rate of suicide; that is people possessing risk factors are more likely to attempt and commit suicide. By acting to

reduce some of these risks, we can lower the number of suicides in the population as a whole (1).

Protective factors on the other hand reduce the likelihood of suicide, that is, they enhance resilience and serve as counterbalance to risk factors (52).

Risk and protective factors have been for convenience been roughly classified under the subsections of Psychosociocultural & environmental factors, Personality traits, Biological & genetic predisposition and Psychiatric illness & other clinical correlates.

Risk Factors

Psychosociocultural & Environmental factors

It has also been seen in many studies conducted in the developing world that suicide was preceded by a period of acute stress. Major life events have almost always been identified in the preceding two weeks before a suicide attempt is made. Stress when chronic has also been identified as one of the reasons for suicide. Stress can result from financial setbacks, grief over the death of a loved one, academic failure, breakup of a marriage and from other environmental and sociocultural factors. Poverty, poor physical health, physical and psychological abuse among other factors lays grounds for low quality of life. All these factors contribute to a higher risk for suicide. Researchers have identified various risk factors that contribute to suicide. The ones that have been consistently recognized have been broadly classified and discussed below with relevant research findings.

Physical abuse

Childhood adversities including physical, emotional and sexual abuse lead to substantially higher risk for suicide. Wife abuse is one of the most significant precipitants of female suicide. Research suggests that if a woman's support group does not defend her when she is the victim of violence that passes the bounds of normative behaviour, her suicide may be revenge suicide, intended to force others to take vengeance on the abusive husband. (71) This was proven from case studies conducted in Papua New Guinea where domestic violence was found to be a normal part of marital relationships, and the major context in which suicide occurred was after severe and physically violent domestic arguments. Abused, shamed, and powerless wives take their own lives to shift the burden of humiliation from themselves to their tormentors. In Fiji, and South American societies, suicide associated with marital violence were also common. Data from a number of societies indicate that wife abuse remains to be one of the most important precipitants of female suicide and suicide attempts. (71) Domestic violence is a fairly common occurrence in most Asian societies and in the rural areas of many developing countries (74) and its practice is to a large extent socially and culturally condoned. And taking into account the marginalized and subjugated role of women in developing countries it is not surprising that many of them turn to suicide as an escape. A highly significant relationship between domestic violence and suicidal ideations has been found in many developing countries in population based samples. In Brazil 48% of women, Egypt 61%, India 64%, Indonesia 11% and in Philippines 28% of women had significant correlation between domestic violence and suicidal ideation.(111)Unique cultural factors can also contribute to spousal abuse in China for instance the government policy of a one child norm has lead to enormous pressure on wives to give birth to the highly preferred male child. On failing which women especially in rural China are not infrequently mistreated, harassed or divorced. The preference for the male child and the ill treatment of the mother who gives birth to a female child is also seen in India. The prevalence of this desire for a male child is seen across the entire country as well as all sections of Indian society. Another distinctive form of abuse in Indian society is associated with dowry disputes. In India, dowries

are a continuing series of gifts endowed before and after the marriage. When dowry expectations are not met, the young bride may be killed or compelled to commit suicide, most frequently by burning, Suicide by burning amongst women is a major concern in India as it has become pervasive throughout all social strata and geographical areas. In a cohort of 152 burned wives, 32 (21%) were immolation suicides, and were associated with dowry disputes, these suicides occurred 2 to 5 years after marriage. (72) In the year 2000, 2446 suicides in India were due to dowry related issues and they constitute 2.3% of suicides in India. (58) In a study conducted in a General Hospital in Durban significantly more married women than men cited marital violence, spousal alcohol abuse and spousal extramarital affairs as precipitants of their self-destructive behaviours.(85) Physical and emotional abuse experienced in the family were statistically more frequent among suicide attempters than among their non-suicidal peers according to a research finding in Lithuania on adolescent girls .(83)

Relative or friend with previous suicidal behaviour

Exposure to knowing someone who has committed suicide especially a close family member or friend significantly increases the odds of the person resorting to suicide when facing a stressful situation. In interviews with 85 patients admitted after a suicide attempt in the general medical wards in Sri Lanka, more than 90% stated that they knew someone who had harmed themselves, and 90% knew someone who had killed themselves. This would indicate that whole communities in Sri Lanka are at very high risk (7) and that the young patients are learning from people around them. They are surrounded by people who have previously attempted suicide. (7) This finding was also corroborated by a study in Taiwan where suicidal behaviours in first-degree relatives were among other factors that significantly correlated with attempted suicide. (43) Suicidal behaviour in the family was identified as one of the significant factors contributing to suicidal behaviour among teenage girls in a study done in Lithuania. (83)

Economic hardships

Loss of a job and major financial setbacks, which often lead to debt traps, has been identified as a major reason for suicide. This is especially so in developing nations where there is limited or nonexistent welfare and social security for individuals to fall back on. Families committing suicide *en masse* due to financial difficulties is not an unusual occurring, especially in India.(78) Studies from Sri Lanka (60,61), India (14) and China (2,5) have shown that poverty, bankruptcy and unemployment are significant risk factors for suicide. The WHO also in its report has identified poverty as a major factor in suicide, followed by stress, mental illness and substance abuse.(89) Higher suicide rates especially among the youth have been associated with higher rates of unemployment.(98) Societies with a large pool of unemployed youth are at higher risk. The recent spate of suicides by farmers in the Warangal district of Andhra Pradesh in Southern India can be directly attributed to the losses that they incurred when their crops of cotton failed.(78) In China where gambling has been a major social problem for centuries it is not uncommon for people to commit suicide due to inability to pay up gambling debts. While there are no clear statistics regarding this, anecdotal reports suggest that gambling has been increasing since the opening up of the economy, especially in rural China. (2). In a study conducted in Iran it was seen that 70% of the suicides were by people belonging to the lower socio-economic status. (67). A study from South Africa showed that 17% of the suicide attempts were as a result of economic deprivation (27) Nigeria, Kenya, Ethiopia, Taiwan, Slovenia and Brazil have all reported that poverty was significantly associated with suicide.(16,18,25,32,57,68)

Suicide pacts

A distressing feature in developing countries is the frequent occurrence of suicide pacts and family suicides. A suicide pact is a mutual arrangement between two or more people to die together at the same time and usually in the same place. Often there is a dominant partner who instigates the idea. Family suicides can be suicide pacts or suicide / homicide wherein the adults first murder their children prior their own suicide. Suicide pacts and family suicides are frequent in India, China and Sri Lanka.

In India 148 suicidal pacts involving 324 persons were studied.(109) Contrary to individual suicides, women (55.7%) outnumbered men (44.3%) (x^2 29.07 df-1 $p < 0.001$). Poisoning by organophosphorous compounds and oleander seeds was the common (69.4%) method of suicide. Pacts involving extramarital partners and lovers (39.8%) were more common than pacts with spouses (26.9%). The reason for suicide were family quarrel (26.9%), extramarital affair (21.6%), love failure (20.1%) and financial problems (19.8%). Thus conflicts related to marriage played a crucial role. Currently a sizeable number of marriages are arranged by families. Young persons who love each other but whose families disapprove of their relationship commit suicide together (called as love failure) as prospect of marrying each other means defying and severing ties with the family. Similar suicide pacts occur frequently in China.(110)

Recent data from India(58) reveal that in the year 2000 , 101 families (624 persons) committed suicide involving 170 males, 234 females and 225 children. Majority of them (n = 593) occurred in the rural areas.

It is clear that women outnumber men in suicide pacts. In individual suicides psychopathology is an important risk factor whereas in suicide pacts social stressors like non-acceptance of love marriage, dowry and financial problems are the crucial risk factors. Suicide pacts are thus more due to social reasons and can be viewed as a form of protest against archaic societal norms and expectations.

Recently there has been an increasing incidence of cyber suicides in Japan. Even strangers chat on internet, plan and commit suicide together at the same time and even at the same place. In the last year alone there were around 20 such suicides. Considering that in India, Sri Lanka and China, there is an increasing usage of internet particularly among the young with a more or less similar cultural background, steps must be taken to see that such cyber suicides do not occur in developing countries.

The following poignant suicide note left by three sisters who hanged themselves in a room depicts the feelings of young women in developing countries.

Suicide Note

> "Dear Mom & Dad,
> Please forgive us for doing this. We curse the fate, which gave you only daughters and no son. Why is the world so unfair? We do not want to burden you. We are not earning and we do not have money to be married. We feel bad to see you both worried, anxious and know that you are desperate to get us married. You have treated us with love and we have given you only misery. We have been good children as you have taught us, but the world wants money and not goodness. We will repay all your love and care in our next lives. We hope at least one of us will be a son to you.
>
> Mallika, Devi and Swarna"

Easy access to lethal means

The availability of highly lethal suicide methods and rates of suicide are related. The high suicide rates in some developing nations partly result from the easy availability of highly lethal methods for suicide, such as pesticides. When fatal methods for suicide are used, the rate of completed suicide approaches the rate of attempted suicide. This may be the case in rural Sri Lanka and China, where suicide rates are 10 to 20 fold higher than in most countries and where the suicide rate in women exceeds that in men. In Sri Lanka for example the fatality rate for a suicide attempt is 9% compared to 1-2% in the U.K.(49)

Self-poisoning with agricultural pesticides or natural poisons such as oleander seeds is an important cause of mortality in many rural areas in Sri Lanka (7). Limiting access to these are difficult, the rural farmer needs ready access to pesticides since they are an important part of the developing world's strategy for increasing its food production. Locking pesticides away safely is also difficult in rural Sri Lanka in as much in most developing countries where the farmers usually live in huts and have no facilities to store pesticides securely. (7). In Sri Lanka during the war there was a marked drop in the use of pesticides as a means of committing suicide, as they were not available easily. Consumption of Oleander seeds were then the preferred method. Since the end of the major conflict pesticide has again come to the forefront as the popular means of committing suicide.(100) In India hanging, self-poisoning, drowning and self-immolation in that order (14) are the most common methods of suicide. The very nature of the methods employed for committing suicide leads to increased fatality. It is virtually impossible to restrict access to these particular methods. In most cases in India self-poisoning is by means of pesticides. The reasons for easy access to it in India are the same as the same as those that exist in Sri Lanka. This holds true for most of the countries in the developing world. A study in China reported that the most commonly used methods to commit suicide was self-poisoning used by 69% of the study population, where in a large proportion of the cases the poison was stored at home. The second most popular way of committing suicide in China was by hanging (20%), followed by drowning (5%) and jumping (2%).(2) The methods used again indicate that the easy availability of a means of committing suicide.

Similar findings are seen from researches in Nigeria where the majority of suicides were committed with Gammalin 20 and the local Dane gun both easily procurable. Those who used the gun applied it to the head and neck region in 76% of the cases.(17) A cross-sectional survey in Ethiopia found that hanging and poisoning were the most frequently reported methods of attempting suicide.(18)When easy access is combined with a highly lethal method mortality rates tend to be high. This is substantiated by a study on young Brazilians in nine cities that reported, the principal means used by youth to commit suicide were hanging, strangling, and suffocation, followed by firearms and explosives again indicating that easy access to means for suicide is a risk factor.(16) Reducing the availability of paraquat to the general population achieved significant reduction in total suicides without a correspondence increase in suicides by other methods. (112)

Social & family conflicts and a sense of isolation

The breakup of a marriage or significant relationship, interpersonal conflicts, the failure to form meaningful relationships, lack of sustenance from support groups often lead to a sense of real or imagined isolation which has been significantly associated with higher risk of suicide.

In the context of developing nations conflict between married couples and parents were the most common, immediate stress factor related to a suicide attempt especially among the young. Studies in Ethiopia reported that the most frequent cause for attempted suicide by

women was marital or family conflict (18). In a prospective study conducted in Ibadan, Nigeria on 39 cases during a six month period in the three main general hospitals, disturbed interpersonal relationships especially with parents, were mainly found to have motivated the acts (32). A study on Suicide attempts or threats by children and adolescents in Johannesburg, South Africa found that one of the major predisposing and antecedent factors were family stress especially divorce and problems at school (33). In another study conducted in South Africa in a regional hospital from 1995 to 1998 where parasuicide cases among youth (15-24 years) were reviewed it was seen that 38% of suicide attempts were triggered by acute social conflicts. Fifty-eight percent of the attempts were categorized as demonstrative and 27% as genuine (28). Biographical and psychiatric factors in 100 patients of the Durban Indian community referred to the department of psychiatry after a suicide attempt were surveyed. One of the major precipitants of parasuicide in this study was an interpersonal dispute; this involved extended family in 63 cases and marital or romantic relationships in 81. (35)

In a clinical-epidemiological study in Brazil a group of cases made up of 50 youngsters, between the ages of 12 and 27, who had attempted suicide some days before were matched with two control groups. One was made up of 50 normal youngsters, and the other one made up of 50 youngsters who had come for their first psychiatric visit but had no suicidal antecedents. When the three groups were compared, it was noticed that the suicidal group revealed: a deep parental gap that had manifested early and that the relationship between parents was worse. It was also seen that children from broken homes had higher rates for suicide attempts. Threats of a breakup with a symbiotic connection (commonly the sexual partner) also lead to suicide attempts (23). Similar results were reported from a study in Lithuania on adolescent girls who had attempted suicide. One of the most important factors contributing to suicide was a disintegrated family.(83)

In Sri Lankan studies the most common risk factor associated with attempted suicide was family and marital discord (49). Sociologists have also suggested that the Sri Lankan youth have few support systems as a consequence of war and poverty and are unable to cope with societal and cultural demands. (7) A study conducted in Chennai, India reported that 51% of the cases taken for the study had marital problems and 42% other family problems (51). The reported causes for suicide in India are quarrel with in-laws and spouse, a failed love affair, dispute over dowry and property, inability to find a suitable match for marriage and inability to meet family expectations (14). This is substantiated by findings of a study conducted in Manipal, India where life events such as marital difficulties, conflicts with key family members, health related problems and failed love affairs were seen in 90% of the suicide attempters. (28) Studies in China also report that the prevalence of social problems that place individuals in morally ambiguous or socially constrained circumstances (2) contribute towards an individual's decision to commit suicide. This is especially so for young rural women in China and other developing nations, where they have low social status and are subject to domestic violence (50). A lower degree of social assimilation was significantly associated with a higher risk of suicide in a study on native Taiwanese population (40). Stresses generated from living in a non-intact family and interpersonal relationships mainly with the opposite sex, came out as some of the main risk factors in a study among Bahraini youth who overdosed. (42)

Non-availability of healthcare, especially mental health

More than two thirds of suicides occur with the first attempt. Rates in developing nations tend to be higher. This is due to the combination of the facts that access to medical facilities are limited and that individuals in these countries generally tend to use highly lethal means to commit suicide. Many of these attempts would probably not have resulted in completed suicides in more developed nations where medical help is more easily accessed.

Accessibility to mental health facilities and professionals are even further limited making early intervention and prevention difficult.

About 65% of the beds for mental health care in the developing world are in mental hospitals. 41% of the developing countries do not have treatment facilities for severe mental disorders in primary health care. And 37% have no community health care facilities (64). In India for example there are only about three thousand five hundred psychiatrists to serve a billion people. Most of these psychiatrists are found in the cities. There are forty thousand beds allocated for mental illness almost all of them are in state run teaching hospitals. There are virtually no mental health care facilities available in primary health care centers and in rural India. In Zimbabwe, there are ten psychiatrists to serve eleven million people. (64) While in Sri Lanka, the entire island is served by fifty-five psychiatrists most of whom are based in cities. Ninety percent of the beds allocated for mental health in Sri Lanka are in the country's two main mental asylums. (63). There are no guidelines in place in general hospitals for routine psychiatric assessment for patients after a suicide attempt. As a result patients with psychiatric disorders as well as those who had harmed themselves receive inadequate mental care. (63) The case fatality rate in Sri Lanka is extremely high with fatality rates for pesticides such as paraquat and organophosphates exceeding sixty percent. Medical management of acute self-poisoning is currently poor; it is believed that a better management protocol would have reduced mortality (7). In yet another study conducted at the Anuradhapura Hospital in Sri Lanka where 12.7% of patients after self-poisoning died when compared with figures of 1to2% in the United Kingdom. The reasons identified for this high mortality include the toxic nature of the substances involved, the lack of antidotes, the long distances between hospitals, and overstretched medical staff. Acute pesticide poisoning does not occur just in Sri Lanka, it is a major problem throughout the developing world, with a worldwide incidence of 3 million cases and 220000 deaths each year. (56)

Cultural beliefs

Suicide rates tend to be high in countries where their cultures both romanticize as well sanctify suicide. In some countries especially in the Far East, suicide is both culturally sanctioned and even approved of in certain circumstances and is seen as an honorable death. Some of the culturally accepted reasons for suicide in China include; following someone in death, fulfill virtue, establish eternal fame, preserve moral integrity, redeem oneself from disgrace and pressure survivors to follow a particular conduct of behaviour (2). Stigma associated with help seeking behaviour especially in the context of mental health prevents many from making contact with mental health professionals.

The glorification of suicide is present in Indian culture as well, the most obvious example being the practice of "sati," the voluntary burning or burying alive of widows, while making the widow believe that performance of "sati" will result in spiritual benefit for her or her deceased husband or her family (38). Suicide, when seen as sacrifice, is revered and is seen as the height of altruism, especially in Hindu philosophy and Hindu religious scriptures are replete with instances when suicide is honorable (55). The cultural acceptance of suicide in a more subtle form can also be seen in popular culture such as films that show suicide as an acceptable solution. The practice of following a leader in death is also not an uncommon occurrence in India, in 1987 in Chennai there was a spate of suicides following the death of a popular politician who had also been a highly successful movie star and had a huge following of fans. Using Suicide as a means of social protest has been present in India for several decades. Men and women have committed suicide over language, and political issues. For example when Hindi was imposed as the national language in Southern India, where different local languages were spoken, some young Indians committed suicide in protest (54). This form of protest has been documented in China as well (65) especially by the marginalized and the powerless who find no other means of protest.

It has been observed in Korea that though the dominant religion of the region Confucianism forbids suicide, Korean society it has been acknowledged has an atmosphere of compassion for suicides. It has long been accepted as a means of escape from the hardships of life (53).

Family history of suicide

A family history of suicide and suicide attempts greatly raises the risk of suicide. Suicide in a family is distressing for each and every member. Children and adolescents bereaved by suicide are known to be more at risk of suffering from a variety of psychiatric problems. A study in India assessed a group of children and adolescents who experienced a suicidal death in the family and reported that they were at an elevated risk for major depressive disorder, posttraumatic stress disorder and impaired social adjustment.(101)The child of a person who attempts suicide has six times the average risk of committing suicide. The effect of modelling of suicidal behaviour of important family members may also increase the risk for future suicidal behaviour in children. Few studies have been done in India to study the effects of family history of suicide. (14) But in one of the studies conducted in a General Hospital in India, family history of attempted suicide or completed suicide was present among patients to a significant extent. (44)

In a case control study in Taiwan 14% of the persons who committed suicide had a family history of suicide. (57) Similar findings were reported In Lithuania in a study conducted on adolescent girls where suicidal behaviour in the family, an incomplete family, parental alcohol abuse, sexual, physical or emotional abuse experienced in the family were statistically more frequent among the suicide attempters than among their non-suicidal peers.(83)

“Copycat” and Local clusters of suicides

The media sometimes give intense publicity to "suicide clusters" — a series of suicides that occur, mainly among young people, in a small area within a short period of time. These have a contagious effect especially when they have been glamorized provoking imitation or “copycat suicides”. This phenomenon has been observed in India on many occasions especially after the death of a celebrity, most often a movie star. The wide exposure given to these suicides in the media has lead to suicides being committed in a similar manner. Copying methods shown in movies are also not uncommon. This is a serious problem especially in India where film stars enjoy an iconic status and wield enormous influence especially over the young who often look up to them as role models. In 1990, the Government of India implemented the recommendation of Mandal Commission which was to reserve 27% of the positions for employment in Government were to be reserved for people from backward class as a form of affirmative action for their upliftment. It created unrest in the student community and a student committed self-immolation in front of a group of people protesting against such a reservation. This was sensationalized and widely publicized in the media. There was a spate of student self immolation (n=31) around the country. These copycat suicides caused public outcry and was considered one of the reasons for the fall of the then government.(113)

Social change

The effects of modernization especially in Asia and specifically in India have lead to sweeping changes in the socioeconomic, sociophilosophical, and cultural arenas of an individual’s life and are greatly adding to the tensions in life leading to substantially higher rates of suicide. (26)

For example in the case of China, the importing of Western values influences the way Chinese people present their idioms of distress. Chinese people who earlier tended to somatize started to psychologize more, which in turn affected the rates of depression and subsequently the risk of suicide. (41)

In India the high rate of suicide among young adults can be associated with greater socioeconomic stressors that has followed the liberalization of the economy and privatization leading to the loss of job security, huge disparities in incomes, the inability to meet role obligations in the new socially changed environment. The breakdown of the joint family system that had previously provided emotional support and stability is also seen as an important factor. (14)

Social upheaval especially war has seen educated youth becoming frustrated at the lack of opportunities and resorting to suicide. This was seen as a major cause for suicide among the educated youth of Sri Lanka. (7)

In a study on Indian women in South Africa it is argued that suicidal behaviours in this group can be understood in the context of sociocultural transition. Transitional tensions between traditional Indian culture and Westernization had an impact on traditional gendered power relations and generated conflicts that had intrapsychic and interpersonal consequences. These in turn had adverse effects on marital functioning, quality of life, and specific aspects of emotional functioning, which were identified as precursors of suicidal behaviour. (22)

Immigrant populations

Migrated populations (including within nation and from rural to urban areas) who are a minority in their “host nations” tend to have a suicide risk rate that are similar to their own indigenous population than that of their “host nation”. Immigrants who feel socially isolated and have difficulties in adjusting to the demands of their new society are a group at higher risk for suicide.

In Sudan an assessment of suicidal ideation in two Sudanese groups of women demonstrated high levels, particularly in women in a displaced-persons area.(20) Studies in South Africa have shown that young South African women of Indian ethnicity are a population with a relatively high rates of suicidal behaviour. This is due to the stress brought upon by their inability to meet the demands of the different culture.(22) Similar studies conducted in Malaysia, Singapore(45), Fiji (73) and U.K(66) as well as other countries have found that immigrant populations from India specifically the women are at high risk for suicide.

A three-year retrospective study was done in Malaysia of cases that were definitely determined as suicides. Ethnic Indians committed 48.8% of all suicides though Indians formed only 8% of the Malaysian population. 38.1% of suicides were Chinese who formed 26% of the population while only 3.6% were Malays, who formed 59% of the population. The high rate of suicide among the immigrant population was attributed to the different cultural, religious and social values (45).

The dramatic rise in Sri Lanka has been attributed in part to the large scale internal immigration which disrupts family, imposes stress and limits the support network,(59). Studies in Sri Lankan settlements with high suicide rates found that insecurity of new settlers coupled with lack of social controls (60) and social inequity as key determinants of suicidal behaviour (61).

Increasing rates of suicide in Israel can be associated with waves of immigration to Israel, and the political and social climate. (37) A study in Israel reported the results of a national

community survey of self-reported suicide ideation and attempts and their relation to psychological distress, depression, social support and adjustment difficulties, in a sample of recent immigrants from the former Soviet Union to Israel. It was seen that the one month prevalence rate of suicide ideation in the immigrant sample (15.1%) was found to be significantly higher than that in Russian controls (6.6%). A total of 5.5% of immigrants but only 0.5% of controls had made a suicide attempt at some time in their lives (47).

Personality traits

Personality characteristics have been associated with higher risk for suicide. The traits that have been identified are a heightened sense of hopelessness, a high score on neurotism, external locus of control, low self-esteem, aggression, novelty seeking behaviour, impulsiveness, etc. The trait of introversion has been associated with higher risk for suicide especially among adolescents. There are limited studies on personality and individual traits that contribute to a suicidal behaviour in the developing world. Most research here tend to focus on environmental factors. Findings that have been considered relevant have been discussed below.

Impulsive and aggressive tendencies and low tolerance for frustration

Persons who have greater lifetime aggressivity and impulsivity and who have poor levels of tolerance for frustration are seen as having a higher risk for suicide than others. These individuals not only are more aggressive toward others and their environment but also are more impulsive in other ways that involve, for example, relationships or personal decisions about a job or purchases. A propensity for more severe suicidal ideation and a greater likelihood of acting on powerful feelings combine to place some at greater risk. The greater frequency of aggressive behaviours in men may partly explain the higher suicide rates reported in men than in women.

Studies in Israel on adolescents have shown that aggressive behaviours can result from overuse of displacement as defense mechanisms and is connected with increased risk for suicidal behaviour. In addition, several immature ego defenses possibly amplify aggression, which then is directed against the self by the maladaptive overuse of introjection, displacement, and repression. (93)

In a study done in India on subjects who attempted suicide in protest against caste based reservation the following personality traits were identified among them, the group as a whole were ambitious, aggressive, hostile and had feelings of alienation. The absence of manifest psychopathology sets this group apart from cases of deliberate self-harm arising in the context of psychiatric morbidity. Thwarted ambitions, a sense of alienation and intropunitive hostility lead to protest, which had become altruistic and resulted in self-immolation.(103)

A sense of hopelessness

Individuals who attempt suicide experience more subjective depression and hopelessness and in particular have severe suicidal ideation perceive fewer reasons for living. One possible explanation for the greater sense of hopelessness and greater number of suicidal ideations is a predisposition for such feelings in the face of illness or other life stressor. In a study on Kuwaiti students it was seen that pessimism, death obsession and anxiety were the best predictors of suicidal ideation.(39). In China however it was seen that rather than the level of hopelessness it was levels of depression that lead to the attempt of suicide.(5)

Poor self-esteem, inadequate coping skills and external locus of control

Inadequate or maladaptive coping skills coupled with a sense of worthlessness have been significantly correlated with suicide. These individuals at risk were seen to have poor self-belief and poor decision-making ability and believed that their life situations were controlled by factors beyond them.

A study carried out on a representative sample of Slovenian high school students found that attempters differed from non-attempters in the levels of self-esteem, emotional reaction to family problems and running away from home.(25).

In a two year study in Sri Lanka on eighty-seven patients, poor problem-solving ability was seen as a significant contributing factors for suicide.(99)

Studies have also shown that people with external locus of control who attribute external causes for their situations often feel powerless and helpless (88) leading to suicide being seen as the preferred way of coping with their situation.

Biological & Genetic predisposition

Converging evidence from family, twin, adoption, brain biochemistry, and nuclear biological studies suggests that vulnerability to suicide may be genetically determined. There is also evidence that the predisposition to suicide remains latent until it becomes activated during puberty. (80)

Family history of psychopathology

Suicidal behaviour is known to be transmitted within families, and the presence of a family history indicates the potential for transmission of both a psychiatric illness that generates suicidal ideation and a diathesis for suicidal behaviour. A family history of psychopathology not only endows genetic vulnerability, (51) but also decreases the social support, increase the discord at home and thereby increase the risk of suicide. A study in India found family history of psychopathology in 60% of the cases that had suicidal behaviour. (51) A six year study (1997-82) on adolescent suicidal behaviour in a child psychiatric unit of a Johannesburg hospital in South Africa found that psychiatric illness in the patient or a family member, was one of the most significant predisposing factor. (33)

Genes regulating serotonin

In association and linkage studies, researchers have identified candidate genes linked to suicidal behaviour, including the gene for tryptophan hydroxylase (the rate-limiting biosynthetic enzyme for serotonin) and the serotonin 5-HT_{2A} receptor gene. Such studies have reported promising associations between an intronic polymorphism in the tryptophan hydroxylase gene and suicide attempt behaviour and lower serotonergic function.(11,13, 79)

Low levels of serotonin, CSF 5 HIAA and reduced activity in the prefrontal cortex

There is some evidence that the most deadly suicide attempts are made by people with low serotonin activity in the prefrontal cortex — the seat of planning, judgment, and inhibition. One study found that in the brains of depressed suicidal patients, this region contained an unusually high number of receptors for serotonin, as though they were trying to compensate for a shortage of the neurotransmitter. Another study found that impulsively aggressive

persons with personality disorders do not activate the normal inhibitory regions of the prefrontal cortex in response to serotonin.(11,13,79)

Reduced cholesterol levels

Recent evidence has linked reduction of cholesterol levels by drugs or diet, as well as spontaneously occurring very low levels of cholesterol, to suicide risk. Though in practical terms, the effect of cholesterol level as a predictive test for risk for suicide is not of much use. (1,11) There is evidence to suggest that low levels of cholesterols are related to increased impulsivity. The reported increased mortality in populations with low cholesterol may derive from increased suicide and accident rates consequent on increased tendencies to impulsivity in these populations.(11)

In a study conducted in Israel Serum cholesterol was compared between those admitted for reasons of suicidal tendencies and those for other reasons. Serum cholesterol levels were significantly lower in adolescent patients who were currently suicidal than in nonsuicidal adolescents.(96)

Psychiatric and other clinical correlates

In developed countries psychiatric illness was highly correlated with suicidal behaviour. In developing countries this relationship is less tenacious and more (or equal) emphasis has been placed on sociocultural factors. But it has been argued that the low rate of diagnosis of mental illness in suicides in developing nations does not preclude the presence of psychiatric problems in the said population. It is believed that mental illnesses are under diagnosed due to a variety of factors such as, limited availability of mental health professionals and resources, the tendency to view suicide as a consequence of some external factor such as domestic problems, a failure in academics or love affair etc., the perception that only psychotic disorders such as schizophrenia are mental illnesses. For example many people in developing countries often do not recognize symptoms of depression and rarely approach facilities for treatment. The stigma associated with mental illness also prevents many who need help from approaching appropriate centers. The relationship of mental illness with suicide is an area in which a growing body of research is now becoming available and many studies now conducted in developing countries especially Asia show that a substantial number of people who commit suicide have had mental illnesses (60-80%). The findings from relevant research studies pertaining to mental illness and other clinical correlates conducted in developing countries have been summarized below, but are considerably lesser than the developed countries.

Mental illness

Psychiatric disorders can lead to a decrease in socioeconomic status, the breakup of a marriage or significant relationship, or the failure to form meaningful relationships, separating the effect of psychosocial adversity from that of psychiatric illnesses can be difficult. Psychiatric illness can lead to psychosocial adversity, and both factors can combine to increase the person's level of stress and thereby potentially increase the risk for suicidal behaviour. (13)

Most studies have found that suicide victims had a psychiatric disorder at the time of suicide. Approximately half of all suicides occur in persons with a mood disorder, and the rest occur in persons with various other psychiatric conditions, including schizophrenia and personality disorders, such as borderline or antisocial personality disorder. A combination of two psychiatric disorders, especially alcoholism or drug addiction along with mood disorder, a personality disorder or schizophrenia, raises the risk for suicide. Although suicide is generally

a complication of a psychiatric disorder, usually depression, most persons with a psychiatric disorder never attempt suicide.

In non-western countries, completed suicides may be less likely to have received a psychiatric diagnosis.(64) Depression is not even acknowledged as a major disease in many developing countries. Studies have reported that countries like Sri Lanka and China, which have some of the highest rates of suicide in the world, have low rates of depression. (64,14)

Research studies in Africa have established that depressive disorders, (a major cause of suicides), thought to be rare in Africa, is fairly common. It was generally present in a rather subtle form with features of somatization. (17). A study in Ethiopia reported that persons with mental illness attempted suicide more often than others. (18). Similarly a study in Cape Town South Africa that compared patients with a history of previous parasuicide to those who had made their first attempt found that increasing severity of suicidal ideation, previous psychiatric treatment and borderline personality disorder increased the risk of reports of previous parasuicide. (21) This is further confirmed by a six year study (1997-82) in a child psychiatric unit of a Johannesburg hospital in South Africa that found psychiatric illness in the patient was a significant predisposing factor in adolescent suicidal behaviour. It was seen that 10% of all referrals to the psychiatry clinic had made suicidal attempts and threats (33) Depressive illnesses, hysterical reactions, and situational disorders, in that order of frequency, were the main causes of suicide attempts identified by investigators in a study in Egypt (36).

A study conducted in a Slovenian school found significantly higher levels of depression, frequency of suicidal ideation, family suicide occurrences, smoking, and alcohol and substance abuse in students who had attempted suicide when compared to those who had not. (25). Similar results were reported from Lithuanian where 57.4% of the female adolescents who had attempted suicide were diagnosed with depression.(83)

Major depressive episode, emotionally unstable personality disorder and substance dependence were significantly correlated with suicidal behaviour in a study from Taiwan (43) In East Taiwan, 90% of the cases taken for a case control study had a predominant diagnosis of depression (dysthymia included). It was also calculated that a person with major depression was eleven times more likely to commit suicide than someone with dysthymia.(57)

Researchers in Taiwan investigated 64 suicidal acts of 62 psychiatric inpatients over a ten year period. The findings indicated the frequency of suicidal behaviour of psychiatric inpatients was 0.91% of total admissions; two thirds of the patients who attempted suicide were diagnosed with schizophrenia or depression. Patients suffering from depression, substance abuse, and personality disorders had a higher parasuicide rate, among whom, those diagnosed bipolar disorder with depressive episode had an extremely high rate. (68)

A study conducted in the Burns' Unit in Israel between the years 1965 and 1986 reported that twenty two (0.37%)of the cases brought to the unit had attempted suicide by fire. Seventeen of them (77 per cent) died from their burns. Fifty percent of the victims were known to have previous mental disorders.(69)Studies from Kuwait also showed that persons who repeat attempts often had a past history of depression.(70) In Iran a study on patients with self-inflicted burn injury found that 43.6% had a psychiatric diagnosis. Depression was the most common psychiatric diagnosis by history. (67)

A study conducted in India in a tertiary care hospital on 373 subjects reported that in suicidal ideators, mixed anxiety and depressive disorder was the most common psychiatric diagnosis followed by major depression and schizophrenia. Among suicide attempters, adjustment disorder with depression was the most common diagnosis. (44). In another study done in

Manipal, India on 73 persons who attempted suicide a psychiatric diagnosis was possible in 93% of the cases. The most common diagnosis was a mood disorder. Dysthymic disorders were associated with 42% of the cases, major depression in 22% of the cases and alcohol abuse in 12%of the cases. Axis II diagnosis was possible in 12% of the cases.21% of the cases received more than one diagnosis. (28)

A population-based case-control study employing the 'psychological autopsy' technique was conducted in 100 completed suicides in India. 88% of the cases received a life time diagnosis for an Axis I disorder, 34% of the cases were alcoholics, mood disorder was present in 25% of the cases, personality disorders were present in 20% of cases and comorbidity was found in 30% of cases.(3) Other studies in India have shown that Personality disorders such as schizoid, histrionic and antisocial type are high risk for suicide.(14) Studies estimate that 9 to 24% of persons with schizophrenia will commit suicide even while under treatment.(75). In India chronic mental illness contributes to 14 to 30% of total suicides.(14)

Prevalence studies in China have shown that depression (1.6%), substance abuse0. 04%), and other mental disorders are not as prevalent as is to be expected if mental disorders are seen as the primary factor determining suicide.(2)This is in contradiction to the west where the incidence rates of these disorders are higher and suicide lower. But results from The Global Burden of Disease study claim that in 1990, unipolar depression was present to the extent of 1.43% of the general population in comparison to the 1.3% in developed countries. Bipolar disorder was recorded at 0.40% in China, much higher than the 0.30% reported in the West. (76) It also estimated that only 5% (versus 35% in developed countries) of the persons with affective disorders received treatment. (77) If this result is accepted it would partially explain China's high suicide rate. (2,)

Alcohol and substance abuse

The relationship between alcoholism and suicide is complex. Suicidal behaviour could be because of biochemical changes as well as situational factors. Alcoholics in the course of their illness are more likely to face a variety of stressors (51) and when they do alcoholics are especially likely to kill themselves in a crisis for example, an arrest or the loss of a husband, wife, or job. (1) Alcohol relieves anxiety, impairs judgment, and loosens inhibitions. Intoxication is an important cause of suicide even in people who are not alcoholics or addicts. (1). The greater frequency of alcoholism in men also partly explains the higher suicide rates reported in men than in women (1). This can also be seen in a study done in a general hospital unit in India where there was virtually no alcohol consumption by female suicide attempters. (28) Cocaine and amphetamines can create another formula for suicide — paranoia and heightened energy. Heroin addicts may take overdoses with suicidal intent (1). Cigarette smoking (13,25) as well has been positively correlated with higher risk for suicide. Consumption of alcohol has been correlated with suicide rates, for instance in Pondichery, India, which has one of the highest rates of per capita consumption of alcohol nationally, also has the highest rate of suicides in India. (58) A population based case control study in India reported that alcoholism was significantly associated with suicide and as much as 34% of the study subjects could be diagnosed as alcoholics. (3,51). This view is also supported by studies done in Taiwan, which found substance use in 40% of the cases. (57) This is further collaborated by the results obtained from a study in Ethiopia where it was reported that people who currently had problem drinking had more suicide attempts over lifetime than others (18). In a study on 269 admissions to an alcohol rehabilitation unit in the Western Cape, South Africa, suicide attempts were reported by 24% of subjects. The characteristics associated with them were female gender, white racial group, not being in a marital relationship, younger current age and early age of problem drinking.(86)

A study in Mexico in the city of Pachuca, Hidalgo on a group of women who were heavy drinkers found that this group of women had 2.3 times the risk of becoming depressed, 2.87 times the risk of taking other drugs, 1.95 times the likelihood of having been sexually abused and 1.57 times the risk of displaying suicidal ideation.(84)

Serious physical illness

Persons with potentially fatal illnesses, such as cancer, have an increased risk for suicide. Pathology involving the brain and abnormality with the central nervous system carry a much higher relative risk for suicide compared with diseases of other systems. (13) The amount of physical discomfort and pain experienced by a person is directly proportional to the possibility of the person attempting suicide. Serious physical illness is one of the leading causes for suicide among the elderly. This is especially so when it is present along with grave financial difficulties. If refusal to take medication and prohibition of medical intervention are viewed as acts of suicide, the figures for suicide in developing countries will rise dramatically. Due to legal, social, cultural and religious factors many suicides in developing countries go unreported. Suicides especially when there are serious physical illnesses present often are certified as resulting from the medical illness rather than from suicide. But a study in a general hospital in Southern India reported that health related problems were one of the significant causes for a suicide attempt. (28)

Previous suicidal attempts

A previous suicide attempt is an important predictor of future suicide or suicide attempt. In Chile a prospective study on 92 women with a mean age of 37 years, who attempted suicide between 1989 and 1991 were followed and reassessed in 1997. In the study period two women committed suicide and thirty attempted suicide. Forty three percent of new self-harm behaviours occurred during the first year after the first suicide attempt and the harming method was similar. In this study, 34% of women with previous suicide attempts repeated this behaviour, using similar methods. (19). In a south African study on suicidal behaviour in 10-15 year olds found that some 30% of the study group had previous suicide attempts or threats, and at least 7% made further serious suicide attempts after initial treatment. (33)

A study was conducted in a tertiary care teaching hospital in India on 260 suicidal ideators, 58 attempters and 55 completers. The percentage of suicide ideators, attempters and completers who had a past history of attempt were 6.9%, 24.1% and 18.2% respectively. (44). Another study conducted in Manipal, India found that 17% of attempters had made a previous attempt. (28). Similar figures were seen in Taiwan where 21% of the attempters had a previous suicide attempt. (57)

Further collaboration that suicide attempters repeat their suicidal behaviour was obtained in a study conducted in Kuwait. It was a one-year cohort of 92 parasuicides who were followed up every 6 months for a period of 2 years since their index parasuicide to study the outcome. One male patient died of suicide (1.1%) and 18 (19.6%) individuals repeated parasuicide using self-poisoning. (70)

Protective Factors

Restricted access to lethal means of suicide

Most researches have focused on the increased risk that easy access to lethal means creates. A study of the intervention programs that focused on reducing access can shed some light on the protective aspects that decreased accessibility provides. Research findings from all over the world have shown that the single most important factor that can

reduce and prevent suicide is when access to highly lethal means of suicide is denied. Most intervention programs start with this area as the primary focus. In Sri Lanka for example where the most common method of committing suicide was by ingestion of poisonous pesticides there has been a significant fall in the suicide rates after the government reduced the sale of certain toxic pesticides.

Easy access to health care

Easy access to clinical care for mental and physical health and early treatment of mental disorders and substance uses lead to a substantial decrease in suicide rates. Availability of effective and immediate interventions in the case of medical emergency also significantly reduces the possibility of suicide. It has been shown that the large majority of the completed suicides are by first time attempters. In persons who have survived suicide attempts it has been seen that a significant proportion of them had decided on impulse and had lower intention. Many suicide victims in developing countries can be saved if timely emergency medical treatment is provided.

Support for help seeking behaviour

Societies where there is acceptance of suicidal feeling as a common human experience and where there is no social stigma associated with seeking psychiatric help. In Sri Lanka where there has been intense campaigning against suicide and the promotion of help seeking behaviour has seen a reduction in the rates of suicide.

Strong bonds with family and society

People who are well integrated with their families and community have a good support system to fall back on in times of crises. Their strong connections with family and society where experiences are enriching are seen as having an important protective influence with regard to suicide. Connectedness to family, school and peers have consistently been associated with diminished risky behaviours. This was seen in a study conducted in Brazil where for both boys and girls the protective factors included having good family relationships, feeling liked by friends and teachers. (92). Similarly in a survey conducted on adolescents from nine Caribbean countries found strong connections with family and school provided the best protective factors.(91)

Support through ongoing medical and mental health care relationships

Suicide rates are lower where there is ongoing support for people who have attempted suicide. These include emotional support at the individual as well as group levels. They also include working with the families of the attempters. Studies have shown that when intervention programs have been implemented in communities and where there has been constant touch between the health care providers and families there have been reduced rates of suicide. The support provided to families and individuals when ongoing in nature and regular can have a protective effect.

Good life skills

Adequate skills in problem solving, conflict resolution and ability to resolve disputes in a non-violent manner greatly reduce the risk of suicide. In a study in Israel on adolescents it was seen that individuals who used sublimation as a form of ego self-defense mechanism had fewer aggressive tendencies and the use of it was identified as a protective factor. (93). Life skills training in schools for children in Sri Lanka lead to a reduction in suicide attempts.

Cultural and religious beliefs

Strong cultural and religious beliefs that discourage suicide and support self-preservation are seen as one of the important factors that prevent suicide. Religions such as Islam and Christianity specifically the Catholics prohibits the taking of one's own life are seen to have a strong inhibitory effect on suicidal behaviour. Data from Islamic countries and from Latin American countries that are predominately catholic seems to bear this out. The incidence rates of suicide in Islamic countries are very low for example in Kuwait it has been put at 0.1 per 100000.(54)

In a study in Ethiopia 3.9% of the Christians had a lifetime suicide attempt compared to 2.9% Muslims (18). This data would suggest that Islam that has stricter prohibitions against suicide has a stronger protective influence on its followers and is able to inhibit suicidal behaviour. The effects of religious festivals on the rates of suicide was studied in Jordan in the month of Ramadan and the month before and after Ramadan for the years from 1986 to 1991. Significantly fewer parasuicides were reported during Ramadan than the month preceding it and the month that follows Ramadan. The findings confirm previous observations that religious events educe the rate of parasuicide, but the protective effect does not persist into the month that follows Ramadan.(29)

In a study in Lady Reading Hospital, Peshawar Pakistan religious beliefs, and responsibility towards family were the two highly scored reasons for living as a whole as well as separately by males and females. Besides this, females had greater fear of social disapproval as compared to males.(90) A survey was administered to representative samples of young people from nine Caribbean countries reduced health risk behaviours were associated with attendance at religious services, connectedness with parents and school (91). A study in India reveals that religiosity is a strong protective shield against suicidal behaviour. Those who committed suicide had less belief in God, had changed their religious affiliation and rarely attended the place of worship when compared to controls (OR 6.83 CI 2.88 19.69). (107)

Presence of community institutions and intervention centers

Community institutions such as religious establishments, youth centers, etc. where people meet and resolve their problems and the availability of crises intervention centers to which people can turn to, in times of need reduce the incidence of suicide. In an intervention program in Sri Lanka where intervention was provided in the form of emotional support, economic opportunities and a forum for the women to meet and support each other. It was seen at the end of four years after the program was initiated that suicide rates had dropped considerably in the villages where intervention was provided in comparison to the surrounding regions that reported an increase of 6% in the corresponding time..(108) Similarly the setting up of call centers for distressed people have seen reduced incidences of suicides. For example in India where 2.1% of suicides are committed by students following failure in exams, the setting up of a 24 hour help line facility during the announcement of the annual school exam results resulted in a reduction in the number of suicides.

Social policies

Effective implementation of social and public policies that pertain to alcohol use, urbanization, pesticide use, social security and welfare, family laws, etc. all contribute to reducing the rate of suicide in a community.

SECTION 2

Human Development Index (HDI) is the measure of human development, which measures the average achievement of a country in three basic dimensions of human development:

- A long and healthy life is measured by life expectancy at birth.
- Knowledge is measured by literacy rate.
- Standard of living is measured by GDP.

HDI index was used to categorise countries into Low, Medium and High. HDI was preferred as it was more relevant to suicide than purely an economic categorisation. The most recent suicide statistics was obtained from the mortality statistics of the WHO's web site.

The average suicide rate for medium HDI countries is calculated as a weighted average of the individual countries, the weights being the proportion of the population of each country in the group.

Table – 1

It is clear from Table 1 that there is an urgent need to improve the data on suicide in Low HDI countries. In Medium HDI countries for 62.5% of countries, there is no data but because there is data on suicide from India and China only for 23.5% of the population, information is unavailable. For roughly half the countries (47%) and one third of the world population (27%) there is no data on suicide.

Table – 2

The overall suicide rate in 80's and 90's appear to be stable. South and Central America have the lowest suicide rate while transition economies in Europe have the highest irrespective of development index. In Asia the high HDI countries have a slightly higher rate than medium developed Asian countries. In transition economies in Europe, the suicide rate increased by 25% in 90s.

Table – 3

Medium HDI countries contribute to 72.9% of suicides in the world with Asian countries in that segment accounting for 56.1% of suicides in the world.

Table – 4

The eight countries (shown in the table) in the medium HDI category account for 69.2% of suicides in the world and 95% of suicides in medium HDI countries. More than half the suicides (54%) in the world occur in China and India. Hence specific intervention strategies should be implemented in these countries. A 10% reduction in suicides in these two countries would result in 30,000 lives saved.

Table – 5

In Asian countries the suicide rate appears stable or suggests even a slight decline in 1990's excepting India, which reveals an increase. The higher female rate in Asian countries is largely due to the influence of China. Kazakhstan and to a smaller extent Turkmenistan reveal an increase in suicide rate in transition economies in Central Asia. The male female ratio in Central Asia is 4:6:1. In Transitional Economies in Europe excepting Republic of Moldavia in all the countries the suicide rate has increased with Russian Federation revealing a steep increase. The male female ratio for this region is 5.2**:**1. In South and

Central American countries the suicide rate has been stable and low. The male female ratio is 3:1. The Caribbean countries have a higher suicide rate than South and Central American countries with Suriname having the highest rate in that region. Island countries like Mauritius also have a high suicide rate.

Co efficient of variation is higher in medium HDI countries compared to high HDI countries suggesting more local reasons for the variation.

Table – 6

The sex ratio for medium HDI countries is 1316 whereas for high HDI countries it is 3271. It can be seen that when compared to high HDI countries, in medium HDI countries women commit more number of suicides than men.

While considering Asian countries, in the Medium HDI countries the ratio is worst for females, and even in high HDI countries the ratio is 2082, which is lower than the rest of the world. Hence Asian women commit more suicide compared to women from rest of the world. Surprisingly it does not apply to Central Asian women where the ratio is similar to Western ratio.

Table – 7

Socio-economic variables, which are likely to impact on suicide rate, were studied. The results reveal that urbanization or human development was not associated with suicide whereas telephone density, which is also a marker of socio economic development, a significant correlation was found. Surprisingly men who were educated were more likely to commit suicide. Gini ratio reveals that when there was more inequality there were more suicides.

Cigarette consumption was significantly associated with suicide rate of both men and women. Though alcohol consumption was not significant, consumption of spirits had a higher correlation when compared to alcohol per se. Contrary to expectations unemployment or crime rate was found to be insignificant. Though not significant, pesticide consumption revealed a higher association for suicide in women.

Table-8

In medium HDI countries(including India) 59%of suicides are committed by persons below 44yrs of age.The pattern in India is different in that 77% of suicides are committed by persons below 44 years compared to 54% in the rest of medium HDI countries. Contrary to developed countries, the elderly (above 77 years) constitute to only 7.5% of suicides. 2% of suicides (approximately 6000) in the medium HDI countries are committed by children below 14 years of age.

SECTION 3

Suicide prevention in developing countries

Developing countries grapple with infectious diseases (old and emergent), malnutrition, infant and maternal mortality, in addition to the high prevalence of cardiac diseases and diabetes. Hence mental health, though perceived as a huge burden is accorded low priority

Even while considering mental health issues chronic and major mental illness are given importance and suicide prevention is grossly neglected. South East Asia and Africa, which

account for 89% of the population, have 0.44 and 0.34 mental health professionals (including psychiatrists, psychiatric nurses, psychologists and psychiatric Social workers) per 100,000 population respectively. (114)

The enormous gap in mental health services has been the catalyst for the emergence of NGOs in mental health. 93.5% of African countries and 80% of South East Asian countries have NGOs in the field of mental health. The formation of the Los Angeles Suicide Prevention centre and the Samaritans in the U.K can be considered the beginning of suicide prevention effort. The next four decades witnessed a tremendous increase in the number of crisis centres, formation of associations and organizations to understand and prevent suicidal behaviour. Though many innovative programmes have been developed to prevent suicide, majority of them have not been evaluated. There are only a handful of programmes, which have shown efficacy. The recent advances in psychopharmacology and mental health services have not dented the suicide rate which otherwise saw a steep rise in the last four decades.

The Governments in developing countries have not been able to address the problem of suicide. NGOs in the form of suicide prevention centre mainly staffed by volunteers have stepped into fill the void. Majority of them are crisis centres or hotlines and their services are free. It is estimated that there are around 2100 volunteers in South East Asia and Africa. In Africa they work in Sudan, Egypt, Zimbabwe, South Africa, Namibia and Mauritius. Sri Lanka, India, Thailand, Indonesia are the developing countries in South East Asia. In China the government has taken an initiative and has sponsored the Beijing Suicide Research and Prevention centre in 2002, which has started a hotline.

The primary goal of these prevention centres is to provide emotional support to the suicidal persons in the population through befriending and counselling in person or by telephone. In many countries they are the premier NGOs in suicide prevention and they are instrumental in increasing the awareness about suicide and its prevention in their respective population. Soon these centres realized that they cannot work with the same modus operandi of the crisis centres in the West and have adapted to meet the local needs. For example, often these centres are the entry point for people with psychological problems. The volunteers are intensively trained in detection of psychiatric illness and appropriate referral methods. In many countries they are the premier or sole agency for suicide prevention and so they have enlarged their perspectives by being proactive in rural and remote areas and for special populations. Many ingenious innovations for raising awareness and increasing help seeking behaviour have been initiated. Though great strides have been made by these centres there are also certain drawbacks. There is wide variability in their expertise and services. Quality control measures are inadequate and majority of their highly publicized programmes are not evaluated.

Sumithrayo is a leading Suicide Prevention NGO in Sri Lanka, which has been functioning for over three decades. In 1996 Sumithrayo designed a controlled study to assess the effectiveness of “befriending” (emotional support) in preventing suicide. They identified two villages with comparable socio-demographics and one was assigned as the index village, the other control village. In the index village two experienced Sumithrayo volunteers were recruited for the project and after training they began the intervention. The initial phase was devoted to establishing a presence in the community by establishing contact with village leaders and organizing public meetings. Every household was visited for gathering basic information. Families where suicide and attempted suicide had occurred and those with economic crisis, illness, violence or interpersonal strife were visited regularly (once a week) and provided emotional support. In addition they initiated small community projects like sewing class, which enabled them to earn small amount of money from selling garments and rag rugs. More importantly it brought the women together for a shared endeavour.

Table 9 describes the success of the programme. The sharp decline in suicide and attempted suicide in the index village contrasts with the rates in rest of the area where there was 6% increase in suicidal behaviour. (108)

Nested Suicide prevention programmes. The enormity of the problem and the paucity of services led to the formation of Sneha a suicide prevention centre in 1986 in Chennai. Since then it has been the flagship centre and has helped start 10 other centres in India. India has no national plan, policy or programme for suicide prevention.

Apart from functioning as a crisis centre, a decision was taken to initiate nested suicide prevention programmes. The idea behind these programmes is that since suicide is a multidimensional problem the component of suicide prevention could be incorporated in other health and social programmes. So relevant, viable successful programmes were identified and the component of suicide prevention introduced. Alcoholism plays a significant role in suicide in India and so with T.T. Ranganathan Foundation, a leading NGO working in Alcoholism, rural camps were conducted about the double danger of alcoholism and suicide. With women activist groups, coping strategies were imparted to female construction workers. Along with another NGO involved in health education in the form of street plays in the urban slums, street plays were conducted in all the slums of the city for 60,000 population. The street plays focused on emotional distress, suicidal thoughts, the need to seek help and the possible support systems. Subsequent visits were also made to assess the impact of the plays and to offer support in the community. Along with an environment activist group, bio pesticides were promoted.

In India 2.1% of suicides (n = 2279) are committed by students following failure in exams (58) Majority of them occur in May/June when the results of the board exams (school final) are announced as the marks obtained determine the course the students can enroll. Enormous competition to get into colleges, the media hype associated with the announcement of the top rankers and the shame associated with failure pushed the distressed student to suicide. With the help of media an awareness campaign was initiated in the year 2001. Public debates, media interviews press releases and guidelines to the media were issued. Parent associations were addressed and Sneha was open for 24 hours for that fortnight. It was also found that students who took their lives fell into two categories a) those who expected a higher percentage and b) those who failed in only one subject. These factors were highlighted and appropriate method of handling the students were reported in both print and television media. The proactive stance taken by Sneha and the enormous media support created tremendous public response. A responsive government has introduced a new scheme in 2002 wherein students who have failed in one subject can rewrite their examination within a month and can pursue their higher studies without losing an academic year. Sustained effort from an NGO resulted in a policy change.

These programmes may not be replicable in other developing countries. However they emphasize the importance of micro sized projects, which are culturally appropriate, locally effective and also the importance of forming community coalitions in suicide prevention.

National Suicide Prevention Plan

The need for a coordinated effort, which brings together various disciplines in an integrated intervention, became apparent. In 1996, UN / WHO issued a summary “Prevention of Suicides: Guidelines for the formation and implementation of various strategies”. The first National Plan was initiated by Finland. Since then Norway, Sweden, New Zealand, Australia, France, Netherlands, Estonia, U.K. and USA have developed a framework, which share a number of common elements. These include increased detection and better management of mental illness particularly depression and substance abuse (alcoholism), improve access to

health care, reduce access to lethal means of suicide, promote responsible reporting of suicide by the media and provide support to those bereaved by suicide.

Among the developing countries only Sri Lanka and Iran have formulated a national suicide prevention plan.

A Presidential Committee on Prevention of Suicide was appointed in 1997 in Sri Lanka. The recommendations were to recognise and address the mental health needs of youth and elderly; provide mechanism to intervene and help families and individuals with problems; Create a culture which discourages suicide; Restrict free availability of pesticides; To change the existing law in order to decriminalise suicide. Suicidal behaviour was decriminalized in 1998 and the government has reduced the sale of certain toxic pesticides. A life skills programme has been introduced in the schools. There is a decline in the suicide ratio of Sri Lanka. Unfortunately the committee ceased to function from November 2000.

In Iran a village based primary care system serves over 60 regions of the country with the village centres linked to surrounding hospitals and medical schools. The national health programme supports training in mental health care for all personnel and the development of a district level mental health care support system. In addition the government has established an urban mental health programme and created four regional centres for prevention of mental disorders with an emphasis on depression and suicide (64).

Suicide Prevention as a Social and Public Health Response

The following reasons outline why suicide prevention should be positioned as a social and public health programme rather than as part of mental health programme in developing countries:

1. One out of 60 people are affected by suicidal behaviour in developing countries of China, India and Sri Lanka.

2. Around 35 – 40% of suicides in developing countries occur below the age of 30 years causing enormous psychological, social and economic burden.

3. Available research indicates that the association between mental disorder and suicide is less robust in developing countries.

4. The attitude to suicide is one of an impulsive way of coping with life stressors. A social reason is readily accepted than a psychological reason. The often asked question is not why he / she has committed suicide, but who made her / him commit suicide Stigma is confined to suicide rather than added stigma of suicide and mental illness.

5. The meagre and sometimes total lack of mental health professionals necessarily propels suicide prevention into social and public health domain.

The public health approach provides a framework for developing an integrated system of interventions across multiple levels such as the individual, family, community and the health care system. More importantly it allows suicide to be perceived as a preventable problem. Suicides are preventable, however effective programmes require commitment and resources.

National Suicide Prevention Strategy in Developing Countries – Guidelines

The different risk and protective factors and the scarcity of human and economic resources necessitates the development of national suicide prevention strategies which are relevant, appropriate and effective in developing countries.

Strategy I

Reduce availability and accessibility to pesticides.

Action :

1. Restrict sale of pesticides to licensed purchasers who are over 21 years of age.

2. Print prominent warning signs on the exterior of the containers.

3. Reduce the toxicity of pesticides by diluting it to non-lethal levels

4. Add emetics or stenching agents to pesticides where possible. Consider the possibility of providing formulations that are not readily absorbed in the human body.

5. Educate the public about the proper handling, storage and use of pesticide

6. Appoint designated persons in the community to store and distribute the pesticides

7. Promote research on other forms of pest control

8. Promote bio-pesticide and phase out chemical pesticides within a time frame.

Stakeholders / Collaborators

Ministry of Agriculture, Ministry of Chemical Industries, Department of Environment, Farmers' Union, chemical distribution and sales personnel, Biotechnology, chemical and medical research institutes, NGOs and media.

Strategy II

Promote responsible reporting of suicide.

Action :

1 Provide guidelines to the media on reporting of suicide.

2. Conduct national, regional and local workshops for media personnel.

3. Enable the media personnel to form a regulatory and self monitoring system for the reporting of suicide.

4. Enable the public to form a "Media watch" forum for monitoring of inaccurate, inappropriate, simplistic and sensational portrayal of suicide

5. Reduce the prevailing practise of depicting suicide as a way of solving personal crisis.

Collaborators

\Ministry of Information and Broadcasting, print and visual media, NGOs, Fan clubs, Censor Boards.

Strategy III

Reduce alcohol availability and consumption

Actions :

To reduce availability:

1. Restrict and control sale of alcohol

2. Increase the minimum age to 21 years for purchase of alcohol

3. Prohibition of illicit distillation and sale of liquor and strict penalties and enforcement.

To reduce consumption :

1. Social marketing to promote a non-alcoholic life style.

2. Prohibit / reduce alcohol advertisements in print and visual media

3. Delink alcohol from sports and youth activities

4. Educate the public about the twin tragedy of alcoholism and suicide

5. Add suicide prevention component in all alcohol and deaddiction programmes

6. Substitute behaviour which offers relaxation and recreation.

7. Provide for early recognition, effective and affordable treatment and rehabilitation of alcohol dependent persons in the community.

Collaborators :

Department of Youth, Education, Sports, Enforcement, Revenue, Media, NGOs, Deaddiction centres and consumers.

Strategy IV

Develop suicide prevention programmes for vulnerable population – Youth and Women.

YOUTH :

Action :

1. Develop Youth centres that promote interconnectedness, improve resilience and improve problem-solving skills.

2. Enhance the scope of Parent Teacher Associations to include suicide prevention.

3. Provide pre and post exam counselling where exam failure is associated with suicidal behaviour.

4. Reduce violence in personal, educational and social life. For eg. Banning of corporal punishment in schools, ragging in colleges.

5. Programmes to rehabilitate and bring into mainstream life, street children, child labourers, abandoned or orphaned children.

Collaborators

Ministry of Education, Social welfare, family welfare, social defence, NGO's, Aid agencies and media.

WOMEN

Action :

1. Educate, provide economic security and empower women

2. Strict enforcement of the prohibition of child marriage, dowry and forced marriage.

3. Reduce media portrayal of women committing suicide due to interpersonal conflicts

4. Reduce violence against women

5. Enhance women's ability to cope with inter-generational conflicts

6. Introduce suicide prevention in all programmes for women

Collaborators :

Department of social welfare, justices, women and children, Education, Social scientists, NGOs and Women's organizations.

Strategy V

Educate primary health workers on suicide prevention.

Actions :

1. Educate the primary health workers on identification intervention and referral of suicidal persons in the community.

2. Train primary health care workers on emergency treatment of self poisoning

3. Train on enlisting support from family and community for acute emotional crisis.

4. Education on early identification of depression and alcoholism and improve listening and referral skills.

Collaborators :

Departments of Health, Education, Social Welfare, NGOs and Health workers' training centres.

Strategy VI

Promote and support volunteer crisis lines (hotlines)

Actions :

1. Encourage the formation of crisis centres in the community.

2. Support the existing crisis centres with economic and technical resources to start centres in rural and remote places and for vulnerable population.

3. Impart training on early identification of psychological illness to all the volunteers in crisis centres as they serve as entry points for the needed mental health service.

4. Formulate a certification process for the crisis centres to ensure adequacy of care.

5. Enable the crisis centres to be more proactive and broaden their scope of functions.

6. Form local NGO networks to support the services of one another.

Collaborators :

Division of Social Welfare, Family Welfare, Voluntary Associations, Citizens Group.

Strategy VII

Improve mental health services and treatment particularly for depression and alcoholism.

Actions :

1. Educate GPs on identification and treatment of depression and alcoholism.

2. Screen for depression in the community and in hospital.

3. Ensure availability of antidepressant medicines (SSRI) in primary health centres.

4. Form links between GPs and mental health professionals and standardize a referral procedure.

5. Ensure psychological assessment by a Mental health professional for all persons who have attempted suicide.

6. Suicide prevention component to be introduced in the medical curriculum.

Collaborator :

Department Health, Education, Medical Association, Pharmaceutical companies, Media, consumers.

Strategy VIII

Provide support to survivors of suicide.

Action :

1. Promote formation of survivor support groups.

2. Identify survivors with high impact potential and enable them to support survivor groups

3. Develop a protocol for starting a survivor support group in developing countries

4. Form community groups to support the survivors of suicide especially in rural areas

5. Encourage the existing crisis centres to broaden their activities to include the needs of survivors.

Collaborators :

NGO, Crisis centres, community leaders, survivors

Strategy IX

Enhance accurate data collection of suicidal behaviour.

Actions :

1. Regular collection of mortality statistics with a separate count for suicides, accidents and undetermined deaths rather than clubbing them into the category of unnatural deaths.

2. Decriminalise attempted suicide (in countries where attempted suicide is a punishable offence) for more accurate data on attempted suicide.

3. Ensure community records are supervised regularly to ensure that all suicidal behaviours have been noted.

4. Enact rules for pension, health and life insurance benefits to the families who have lost some one by suicide which will encourage better reporting.

Collaborators :

Department of Health, Crime, Statistics, Insurance corporations

Strategy X

Form Alliance with Native healers, practitioners of alternate medicine and faith healers.

Actions :

1. Conduct suicide prevention training workshop for native healers and practitioners of alternate system of medicine.

2. Encourage a referral system to the nearest GP or mental health professional for those in emotional crises.

3. Provide training for early identification of depression.

4. Utilise their influence in the community to alter the environmental stressors of the suicidal persons.

Collaborator :

NGO's, Community Associations and practitioners.

Structure

Developing a centralised independent infrastructure for suicide prevention is impractical in developing countries. The focus should be on identification of community resources, effective utilization of the resources and providing support for their suicide prevention activities.

I. Community

Community support committees can be formed to provide emotional support to persons in suicidal crisis. Persons in the community who have the qualities of being good listeners, are warm and empathetic and also non-judgmental and confidential should be recruited.

Community Action Committee comprising the community leader, primary health worker, general practitioner, teacher, religious leader should be formed to offer practical support to the community support committee. Community support committee would provide emotional support and the action committee would provide practical support using their considerable influence in the community to modify the external precipitating stressors of the suicidal persons. Two committees are required as the skill set for emotional support and practical support are quite different.

Regional

A regional / state committee should be formed whose main functions would be :

1) To Provide support to community committees;

2) To coordinate with other organizations (governmental / non-governmental) to include suicide prevention component in various programmes.

3) To act as a link between local and national committees.

National committee

A bipartisan national committee should be constituted with policy makers, planners, researchers, service providers, NGOs and survivors with the following objective.

1) To develop a viable national suicide prevention plan.

2) To promote advocacy work in suicide research and prevention

4) Develop country and culture specific guidelines

5) Provide support to regional and local committees

6) Design, implement and evaluate interventions.

Conclusion :

It is evident that suicide and suicidal behaviour is a major public health problem in developing countries in spite of gross underreporting of suicide. Urgent and effective measures have to be taken for more accurate and reliable data on suicide and suicidal behaviour. There is also a dearth of research on suicide and a need to find the various risk and protective factors in developing countries. Suicide should be considered as a priority issue by the governments, planners, professionals, NGOs and the public. In resource scarce developing countries, suicide prevention strategies should emphasize on co-operation, collaboration and commitment. Suicide prevention in developing countries is more a social objective than a traditional exercise in health sector.

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Table 1 : Availability of Data on Suicides in different Regions of the World in the 1990s

Region		Number (percent) countries and percent of population for which suicide data are not available in 1990s							
		Low HDI		Medium HDI		High HDI		Total for the region	
		No. of (%) Of Countries	Percent of population	No. of (%) of Countries	Percent of population	No. of (%) of Countries	Percent of population	No. of (%) of Countries	Percent of population
1	Africa	28 / 29	97.5	12 / 13 (92.3)	98.5	Nil / 1 (0.0)	Nil	40/43 (93.0)	97.6
2	Arab Countries	2 / 2 (100.0)	100.0	11 / 12 (91.7)	75.1	3 / 4 (75.0)	66.1	16/18 (88.9)	76.3
3	South & Central Americas and the Caribbean	1 / 1 (100.0)	100.0	13 / 23 (56.5)	19.8	1 / 11 (9.1)	2.5	15/35 (42.9)	14.3
4	Asia (South, South-East & Pacific)	2 / 2 (100.0)	100.0	16 / 21 (76.2)	17.4	1 / 5 (20.0)	1.6	19/28 (67.9)	20.7
5	Central Asia – Transition economies	NA	NA	Nil / 8 (0.0)	Nil	NA	NA	Nil / 8 (0.0)	Nil
6	Europe – transition Economies	NA	NA	Nil / 6 (0.0)	Nil	Nil / 10 (0.0)	Nil	Nil / 16 (0.0)	Nil
7	Other European North American Countries, Aus. & NZ	NA	NA	2 / 3 (66.7)	96.8	1 / 24 (4.2)	0.1	3/27 (11.1)	8.6
Total		33 / 34 (97.1)	98.2	54/86 (62.8)	23.5	6 / 55 (10.9)_	0.4	93 / 175 (53.1)	27.3

Note : There are no Low HDI countries among Transition Economies and among “Other European & North American Countries, Aus. & NZ”; There are no High HDI countries among Transition Economies in Central Asia. The “NA” in these cases stands for “Not Applicable”

Table 2 : Annual Rates of Suicide in the 1980s & 1990s in different Regions

HDI Level	Decade	Number of suicides per year per 100,000 population in the different regions					
		Asia	Transition Economics		Europe & North America, Aus. & NZ	South & Central Americas & the Caribbean	Total
			Central Asia	Europe			
Medium HDI	1980s	13.2	12.3	26.5	NA	3.5	13.1
	1990s	12.4	10.5	35.1	NA	4.2	13.3
High HDI	1980s	16.3	NA	21.5	12.7	4.8	13.0
	1990s	15.1	NA	21.4	12.6	5.5	12.7
Total	1980s	13.5	12.3	25.1	12.7	4.0	13.1
	1990s	12.6	10.5	31.0	12.6	4.7	13.1

Note : Zimbabwe which is a Low HDI country in Africa has been included in the "Medium HDI – Asia" group in this table; The Arab countries, Iran, Mauritius and Macedonia TFYR all of which are "Medium HDI countries" are also clubbed here.

Table 3 : Distribution of suicides by Regions in the 1980s and 1990s

HDI Level	Decade	Annual number of (recorded) suicides in the region as a percent of total number of (recorded) suicides in the world in the year .					
		Asia	Transition Economics		Europe, North America, Aus. & NZ	South & Central Americas & the Caribbean	Total
			Central Asia	Europe			
Medium HDI	1980s	56.8	1.4	12.0	NA	1.6	71.8
	1990s	56.1	1.4	13.4	NA	2.0	72.9
High HDI	1980s	6.3	NA	4.0	16.5	1.5	28.2
	1990s	5.1	NA	3.6	16.7	1.7	27.1
Total	1980s	63.1	1.4	16.0	16.5	3.1	100.0
	1990s	61.2	1.4	17.0	16.7	3.7	100.0

Table 4 : Some Medium HDI Countries with Large Number of Recorded Suicides

Country	Annual suicide rte in the 1990s	Annual number of suicides (recorded) in the 1990s	
		As a percent of total (recorded) suicides in the world	As a percent of total (recorded) suicides in medium HDI countries
1. Russian Federation	41.5	11.6	15.9
2. Ukraine	29.6	0.9	1.2
3. Kazakhstan	26.8	0.9	1.2
4. Sri Lanka	21.6	0.7	1.0
5. Bulgaria	16.9	0.3	0.4
6. China	16.1	37.2	51.0
7. Romania	12.1	0.5	0.7
8. India	9.7	17.2	23.6
Total for the 8 countries	15.3	69.2	95.0
All medium HDI countries	13.3	72.9	100.0
All the countries	13.1	100.0	--

Table 5 : Suicide Rates in Different Countries in the Medium HDI Group

Region	Country	Suicide rate, 1980s			Suicide rate, 1990s		
		Total	Male	Female	Total	Male	Female
Asia	1. China	17.6	15.5	20.4	16.1	14.3	17.9
	2. Thailand	5.8	6.8	4.8	4.0	5.6	2.4
	3. Phillipines	NA	NA	NA	2.1	2.5	1.7
	4. India	7.1	8.2	6.0	9.7	11.4	8.0
	5. Sri Lanka	35.8	48.8	22.3	21.6	NA	NA
	6. Iran	NA	NA	NA	0.2	NA	NA
Average for the region		13.2	12.6	14.2	12.5	12.5	13.0
Transition Economies in Central Asia	7. Georgia	4.6	6.7	2.6	2.9	4.8	1.2
	8. Kazakhstan	22.4	36.4	9.4	26.8	46.4	8.6
	9. Kyrgyzstan	11.7	17.9	5.7	11.6	19.3	4.0
	10. Tajikistan	5.9	8.0	3.9	2.9	4.2	1.6
	11. Turkmenistan	7.5	11.0	4.2	8.5	13.8	3.5
	12. Uzbekistan	8.3	12.1	4.6	6.8	10.5	3.1
	13. Armenia	NA	NA	NA	1.6	2.5	0.7
	14. Azerbaijan	NA	NA	NA	0.8	1.2	0.4
Average for the region		12.3	19.1	5.9	10.5	17.5	3.8
Transition Economies in Europe	15. Albania	2.3	3.0	1.6	4.9	6.3	3.6
	16. Bulgaria	16.3	23.2	9.4	16.9	25.2	9.1
	17. Rep. Of Moldavia	20.3	32.6	9.2	14.9	26.7	4.1
	18. Romania	9.0	13.3	4.7	12.1	20.8	3.9
	19. Russian Fed.	31.2	52.9	12.3	41.5	72.9	13.7
	20. Ukraine	22.3	37.7	9.1	29.6	52.1	10.0
Average for the region		26.5	44.5	10.8	35.1	61.2	11.7

Continued…..

Region	Country	Suicide rate, 1980s			Suicide rate, 1990s		
		Total	Male	Female	Total	Male	Female
South & Central Americas	21. Brazil	3.1	4.7	1.6	4.1	5.6	1.6
	22. Columbia	3.6	5.7	1.6	3.5	5.5	1.5
	23. Ecuador	4.2	5.9	2.5	4.8	6.4	3.2
	24. El Salvador	10.7	15.1	6.2	7.9	10.4	5.5
	25. Nicaragua	1.4	2.0	0.9	3.4	4.7	2.2
	26. Paraguay	2.7	3.1	2.4	2.3	3.4	1.2
	27. Venezuela	4.3	7.2	1.8	5.1	8.3	1.9
Average for the region		3.5	5.3	1.8	4.2	5.9	1.8
Caribbean	28. Belize	0.5	1.1	0.0	6.5	12.0	0.9
	29. Guyana	1.4	1.7	1.1	10.5	14.6	6.5
	30. Suriname	21.5	31.7	11.6	11.9	16.6	7.2
Average for the region		7.0	10.1	3.9	10.3	14.8	5.9
Others	31. Macedonia TFYR (Europe)	NA	NA	NA	7.4	10.3	4.5
	32. Mauritius	10.6	13.8	7.3	13.5	21.1	5.5
	33. Zimbabwe	NA	NA	NA	7.9	10.6	5.2
Average for all the medium HDI countries		13.1	14.8	12.7	13.3	15.4	11.7
Avg – High HDI Countries		13.0	20.0	7.2	12.7	19.3	5.9
Avg – All countries		13.1	16.4	11.0	13.1	16.5	10.1
Coeff of var. (%)	Medium HDI	85.9 (n=27)	91.4 (n=27)	88.9 (n=27)	91.6 (n=33)	103.1 (n=31)	84.5 (n=31)
	High HDI	72.0 (n=49)	72.2 (n=49	77.9 (n=49)	68.9 (n=49)	74.6 (n=48)	63.8 (n=48)

Table 6 : Gender Specific Suicide Rates in the 1990s in different Regions

Gender	HDI Level	Asia	Transition Economics		Europe, North America, Aus. & NZ	South & Central Americas & the Caribbean	Total
			Central Asia	Europe			
Male	Medium HDI	12.5	17.5	61.2	NA	5.9	15.4
	High HDI	20.4	NA	36.1	19.5	8.6	19.3
Female	Medium HDI	13.0	3.8	11.7	NA	1.8	11.7
	High HDI	9.8	NA	8.7	5.8	2.5	5.9
Sex ratio for the rates	Medium HDI	962	4605	5231	NA	3278	1316
	High HDI	2082	NA	4149	3362	3440	3271

Note1

. Sex ratio for the suicide rates is defined as :

$$X \frac{\text{suicide rate for males}}{\text{suicide rate for females}} 1000$$

Table 7 : Correlation Coefficients between Suicide Rates and Socio-Economic Variables across Countries with Medium HDI

Broad nature of socio-economic variable	Socio-economic Variable	Annual suicide rate in 1990s		
		Total	Male	Female
Socio-economic variables generally associated with higher levels of development	1. Human Development Index, 1995	+ 0.21 (n=26)	+ 0.27 (n=24)	- 0.12 (n=24)
	2. Human Development Index, 2001	+ 0.19 (n=33)	+ 0.24 (n=31)	- 0.01 (n=31)
	3. Education Index, 2001	+ 0.26 (n=33)	+ 0.31** ((n=31)	- 0.06
	4. Urban population as a percent of total population, 2001	+ 0.03 (n=33)	+ 0.18 (n=31)	- 0.04 (n=31)
	5. Telephone density, 2001	+ 0.36* (n=33)	+ 0.44* (n=31)	+ 0.32** (n=31)
	6. Gender Development Index, 2001	+ 0.26 (n=27)	+ 0.26 (n=25)	+ 0.004 (n=25)
Socio-economic variables generally associated with aspects of dysfunctionalities in society	7. Gini ratio (inequality)	- 0.33** (n=29)	- 0.31** (n=27)	- 0.23 (n=27)
	8. Cigarette consumption per head	+ 0.41* (n=27)	+ 0.46* (n=25)	+ 0.40* (n=25)
	9. Alcohol (total) consumption per head	+ 0.13 (n=30)	+ 0.20 (n=29)	- 0.02 (n=29)
	10 Alcohol consumption (spirits) per head	+ 0.19 (n=30)	+ 0.23 (n=29)	+ 0.24 (n=29)
	11. Unemployment rate	+ 0.08 (n=19)	+ 0.14 (n=17)	- 0.15 (n=17)
	12. Crime rate (in major cities)	- 0.03 (n=15)	- 0.007 (n=15)	- 0.14 (n=15)
Other variables	13. Pesticide consumption (per hectare of land)	- 0.06 (n=24)	- 0.10 (n=22)	- 0.25 (n=22)

Note : 1. Figures in brackets give number of observations.

2. * represents significant at 5% level & ** : significant at 10% level.

Table-8
Distribution of suicides by Age-groups in the Medium HDI countries in the 1990s

Region	Gender	Number of suicides per year in different age-groups								
		5-14	**15-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75 +**	**All**
	Male	1859 (1.1)	23150 (13.5)	33924 (19.8)	31027 (18.0)	25042 (14.6)	23294 (13.6)	22509 (13.1)	10725 (6.3)	171530 (100.0)
Medium HDI Countries excl. India	Female	1098 (0.9)	23953 (20.0)	23655 (19.7)	18001 (15.0)	13372 (11.2)	13387 (11.2)	15181 (12.7)	11182 (9.3)	119829 (100.0)
	Total	2957 (1.0)	47103 (16.2)	57579 (19.8)	49028 (16.8)	38414 (13.2)	36681 (12.6)	37690 (12.9)	21907 (7.5)	291359 (100.0)
India		**Upto 14**	**15-29**	**30-44**	**45-59**	**60 +**	**All**			
	Male	1504 (2.9)	18666 (35.7)	18201 (34.8)	10244 (19.6)	3742 (7.1)	52357 (100.0)			
	Female	1670 (4.5)	17812 (48.4)	10883 (29.6)	4699 (12.8)	1757 (4.8)	36821 (100.0)			
	Total	3174 (3.6)	36478 (40.9)	29084 (32.6)	14943 (16.8)	5499 (6.2)	89178 (100.0)			

Table 9

	Index village	**Control village**
Population	404 (125 households)	410 (121 households)
Religion	Buddhism	Buddhism
Employment	Farmers / Manual Labourers	Farmers / Manual Labourers
Electricity / Telephones	Nil	Nil
Before intervention (between 90-95)		
No. of suicides	13	16
No of suicide Attempted18	25	
After intervention (between 90-95)		
No. of suicides	--	3
No. of suicides Attempted--	10 (4 years)	(2 years)